Listing and Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application

1. (Currently Amended) A method for Automatic Frequency Control in a Code Division Multiple Access system ~~generating an error signal~~, comprising the steps of:

accumulating sign information relating to phase differences in received signals;

comparing the accumulated sign information against predetermined threshold levels; ~~and~~

generating ~~the~~ an error signal when at least one of the predetermined threshold levels is satisfied[.]; and

controlling gain in an Automatic Frequency Control (AFC) loop in the Code Division Multiple Access system in accordance with the error signal.

Cancel claim 2.

3. (Currently amended) The method according to ~~claim 2~~ claim 1, further comprising the steps of:

multiplying a current despread pilot signal with a complex conjugate of a previous despread pilot signal; and

obtaining a sign value of a product of said multiplying step.

4. (original) The method according to claim 3, wherein said step of obtaining a sign value comprises the step of extracting the sign value of an imaginary part of the product of said multiplying step.

5. (original) The method according to claim 1, wherein said predetermined threshold levels include a positive threshold and a negative threshold.

6. (original) The method according to claim 5, wherein said generating step comprises the steps of generating a positive constant error signal when the positive threshold is satisfied, and generating a negative constant error signal when the negative threshold level is satisfied.

Cancel claim 7

Cancel claim 8

Claim 9 (Currently amended) The method according to ~~claim 8~~ claim 1, wherein the values of the error signals are constant values ~~capable of being adjusted to control the gain in the AFC loop~~.

10. (Currently amended) The method according to claim 1, further comprising the step of utilizing the predetermined threshold levels to affect a bandwidth of ~~an~~ the Automatic Frequency Control (AFC) loop.

11. (original) The method according to claim 1, further comprising the step of resetting the accumulated sign information when the error signal is generated.

12. (Currently amended) A method for generating an error signal for an ~~automatic frequency control~~ Automatic Frequency Control (AFC) loop in a Code Division Multiple Access (CDMA) system, comprising the steps of:

accumulating sign information relating to phase differences in received pilot signals;

decimating the accumulated sign information; and

utilizing an output of said decimating step as the error signal for the AFC loop.

13. (original) The method according to claim 12, further comprising the steps of:

multiplying a current despread pilot signal with a complex conjugate of a previous despread pilot signal; and

obtaining a sign value of a product of said multiplying step.

14. (original) The method according to claim 13, wherein said step of obtaining the sign value comprises the step of extracting the sign value of an imaginary part of the product of said multiplying step.

15. (original) The method according to claim 12, wherein the output of said decimating step is utilized as the loop error signal upon a decimation of a threshold number of the samples.

16. (original) The method according to claim 15, further comprising the step of resetting the output of said decimating step at a same interval as when the output of said decimating step is utilized as the loop error signal.

Cancel claim 17

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Cancel Claim 19

20. (Currently amended) An apparatus for generating an error signal for an ~~automatic frequency control~~ Automatic Frequency Control (AFC) loop in a Code Division Multiple Access (CDMA) system, comprising:

an accumulator for accumulating sign information relating to phase differences in received pilot signals;

a decimator for decimating the accumulated sign information so as to output the error signal therefrom.

21. (original) The apparatus according to claim 20, wherein the output of said decimator is utilized as the error signal upon a decimation of a threshold number of the samples.

22. (original) The apparatus according to claim 21, wherein the output of said decimator is reset at a same interval as when the output of said decimator is utilized as the error signal.

23. (Currently amended) A method for generating an ~~loop~~ error signal for an ~~delay-lock code tracking~~ Automatic Frequency Control (AFC) loop in a CDMA system for Automatic Frequency Control, comprising the steps of:

accumulating sign information relating to phase differences between samples of a received code sequence;

comparing the accumulated sign information against adaptable threshold levels; ~~and~~

generating the ~~loop~~ error signal when at least one of the adaptable threshold levels is satisfied[.]; and

controlling gain in the Automatic Frequency Control loop in the Code Division Multiple Access system in accordance with the error signal.

Cancel claim 24

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Cancel claim 26

27. (Previously presented) The method according to claim 23, wherein the adaptable threshold levels include a positive threshold and a negative threshold.

28. (Currently amended) The method according to claim 27, wherein said generating step comprises the step of generating a positive constant ~~loop~~ error signal when the positive threshold is satisfied, and generating a negative constant ~~loop~~ error signal when the negative threshold level is satisfied.

Cancel claim 29

Cancel claim 30.

31. (Currently amended) The method according to claim [30] 23, wherein the values of the ~~loop~~ error signal are constant values capable of being adjusted to control the gain in ~~the delay-lock code tracking~~ Automatic Frequency Control loop.

32. (Currently amended) The method according to claim 23, further comprising the step of utilizing the adaptable threshold levels to affect a bandwidth of the ~~delay-lock code tracking~~ Automatic Frequency Control loop.

33. (Currently amended) The method according to claim 23 ~~wherein~~, further comprising the steps of:

retrieving samples of the received code with different delays from a sample buffer in the ~~delay-lock code tracking~~ Automatic Frequency Control (AFC) loop and; ~~includes a receiver sample buffer from which the samples of the received code sequence may be retrieved with different delays, and the method further comprises the step of~~

adjusting a position of the samples in the ~~receiver~~ sample buffer based on the ~~loop~~ error signal.

34. (Currently amended) The method according to claim 33, further comprising the step of filtering the ~~loop~~ error signal prior to said adjusting step.

35. (Currently amended) An apparatus for generating an error signal for an ~~delay-lock code tracking~~ Automatic Frequency Control (AFC) loop in a CDMA system, comprising:

an accumulator for accumulating sign information relating to phase differences between samples of a received code sequence;

a comparator for comparing the accumulated sign information against adaptable threshold levels; and

an error signal generator for generating the error signal when at least one of the adaptable threshold levels is satisfied.

Cancel Claim 36

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Cancel Claim 38

39. (Currently amended) The apparatus according to claim 35, wherein said error signal generator generates ~~is for generating~~ a positive constant error signal when a positive threshold is satisfied, and generates a negative constant error signal when a negative threshold level is satisfied.

40. (Currently amended) The apparatus according to claim 39, wherein the positive constant error signal and the negative constant error signal ~~are for~~ control~~ling a~~ gain of the ~~delay-lock code tracking~~ Automatic Frequency Control loop.

41. (Currently amended) The apparatus according to claim 35, further comprising a ~~receiver~~ sample buffer for allowing the samples of the received code sequence to be retrieved there from with different delays, and for adjusting positions of the samples in the buffer based on the error signal.

42. (Currently amended) The apparatus according to claim 41, further comprising a filter for filtering the error signal prior to adjusting the positions of the samples in the ~~receiver~~ sample buffer.

43. (Currently amended) A method for generating a ~~loop~~ error signal for ~~a delay-lock code tracking~~ an Automatic Frequency Control (AFC) loop in a CDMA system to achieve Automatic Frequency Control, comprising the steps of:

accumulating sign information relating to phase differences between samples of a received code sequence;

decimating the accumulated sign information; ~~and~~

utilizing an output of said decimating step as the ~~loop~~ error signal for the delay-lock code tracking loop[.]; and

controlling gain in the Automatic Frequency Control loop in the Code Division Multiple Access system in accordance with the error signal

44. (Currently amended) The method according to claim 43, wherein the output of said decimating step is utilized as the ~~loop~~ error signal upon a decimation of a threshold number of the samples.

45. (Currently amended) The method according to claim 44, further comprising the step of resetting the output of said decimating step at a same interval as when the output of said decimating step is utilized as the ~~loop~~ error signal.

Cancel claim 46

Cancel claim 47

Cancel claim 48

49. (Currently amended) The method according to claim 43 ~~46 wherein~~, further comprising the steps of:

retrieving samples of the received code with different delays from a buffer in the ~~delay-lock code tracking~~ Automatic Frequency Control loop and; ~~includes a receiver sample buffer from which the samples of the received code sequence may be retrieved with different delays, and the method further comprises the step of~~

adjusting a position of the samples in the ~~receiver~~ ~~sample~~ buffer based on the ~~loop~~ error signal.

50. (Currently amended) The method according to ~~claim 43~~ claim 49, further comprising the step of filtering the ~~loop~~ error signal prior to said adjusting step.

51. (Currently amended) An apparatus for generating an ~~loop~~ error signal for ~~a delay-lock code tracking~~ an Automatic Frequency Control (AFC) loop in a CDMA system, comprising:

an accumulator for accumulating sign information relating to phase differences between samples of a received code sequence; and

a decimator for receiving the accumulated sign information from said accumulator and for decimating the accumulated sign information,

wherein an output of said decimator is utilized as the ~~loop~~ error signal for the ~~delay-lock code tracking~~ Automatic Frequency Control loop.

52. (Currently amended) The apparatus according to claim 51, wherein the output of said decimator is utilized as the ~~loop~~ error signal upon a decimation of a threshold number of the samples.

53. (Currently amended) The apparatus according to claim 52, wherein the output of said decimator is reset at a same interval as when the output of said decimator is utilized as the ~~loop~~ error signal.

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Cancel claim 56

57. (Currently amended) The apparatus according to claim 51, further comprising a ~~receiver~~ sample buffer for allowing the samples of the received code sequence to be retrieved there from with different delays, and for adjusting positions of the samples in the buffer based on the error signal.

58. (Currently amended) The apparatus according to claim 57, further comprising a filter for filtering the error signal prior to adjusting the positions of the samples in the ~~receiver~~ sample buffer.